



Risk Retirement: moving from scientific evidence to regulatory application

Pacific Northwest National Laboratory

OREC Workshop
September 24, 2021

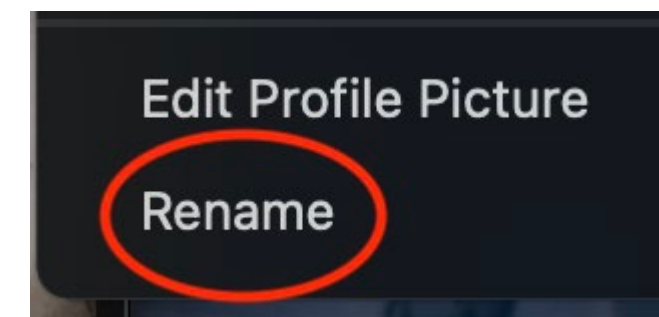
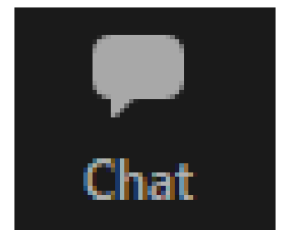
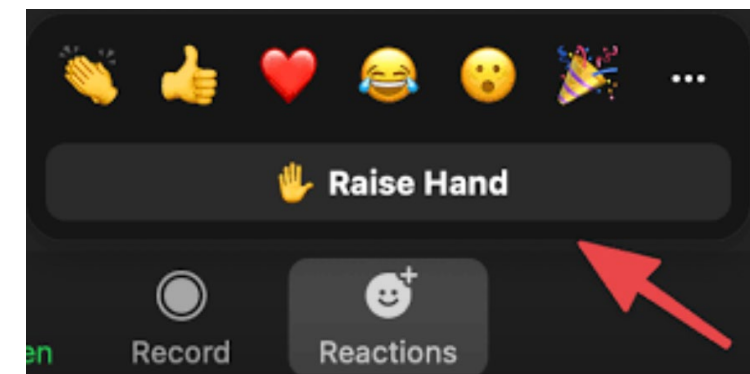
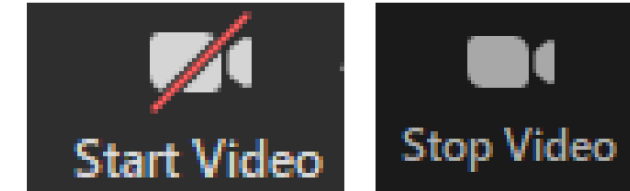


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Technical Notes for Zoom

- Keep your video off, but consider turning it on for the breakout groups
- Stay muted unless you are speaking
- To ask a question, raise your hand
Or enter it in the chat box:
- Please add your institution to your name (e.g. “Andrea Copping, PNNL”)



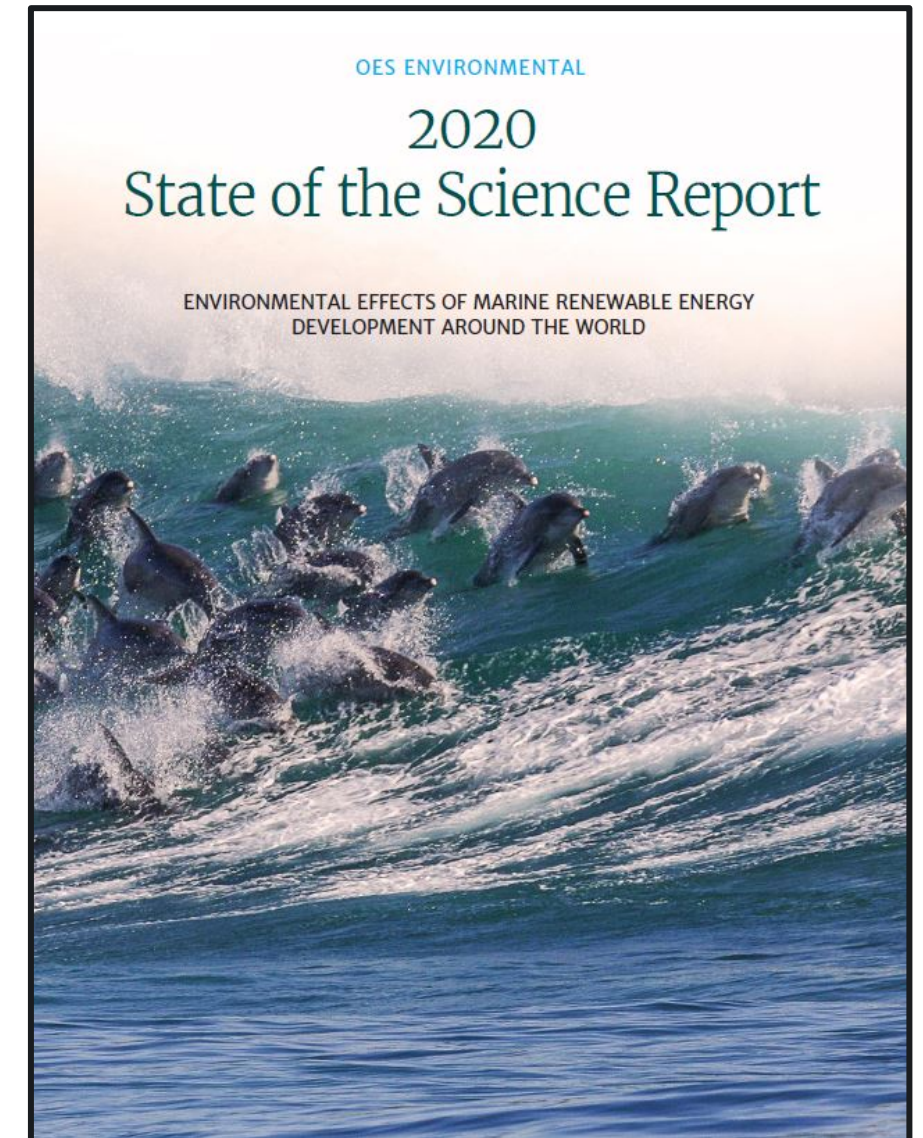
Agenda

10:30 – 10:45am	Introductions and presentation on risk retirement
10:45 – 11:20am	Breakout #1: risk retirement for: <ul style="list-style-type: none">• Changes in habitat• Underwater noise• Electromagnetic fields• Changes in oceanographic systems
11:20 – 11:30am	Presentation on guidance documents
11:30am – 12:05pm	Breakout #2: guidance documents
12:05 – 12:30pm	Report, out discussion, and wrap-up
12:30pm	Adjourn



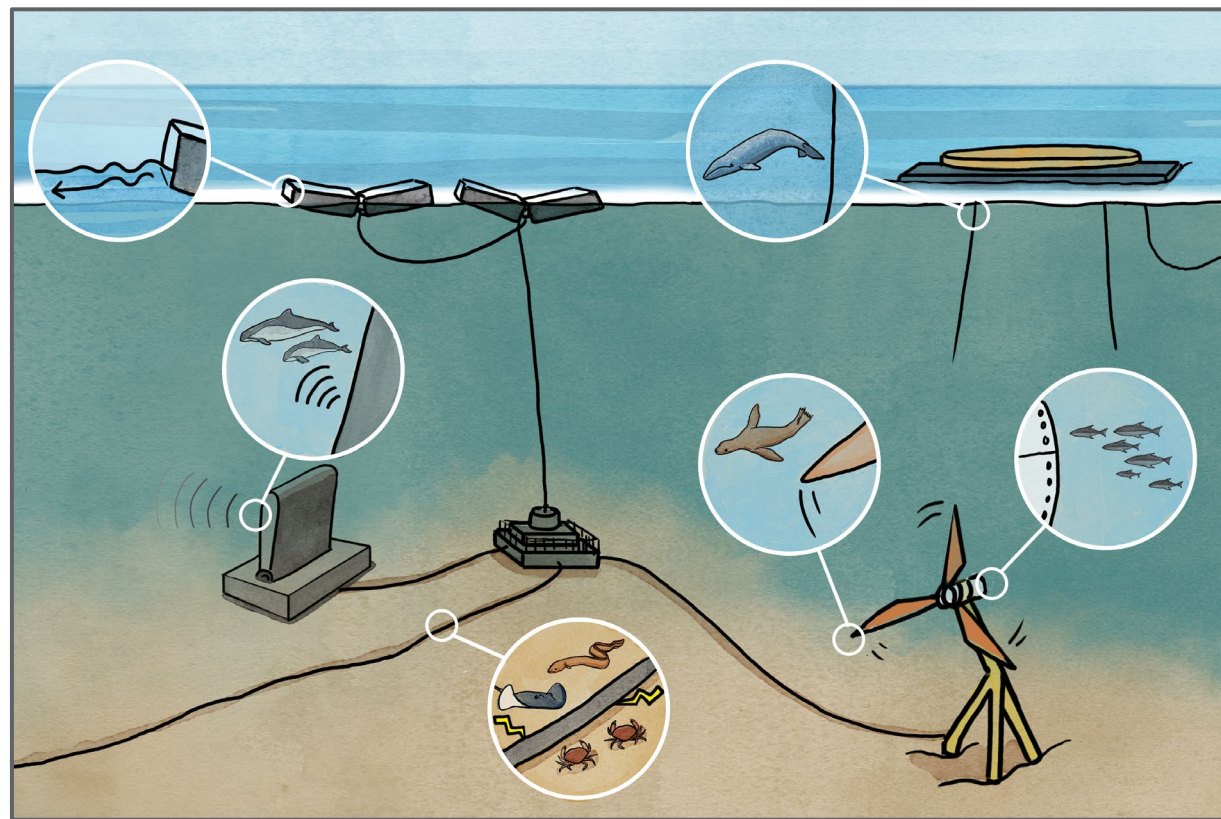
OES-Environmental

- Established by the International Energy Agency Ocean Energy Systems in 2010
- Led by the US DOE Water Power Technologies Office and implemented by Pacific Northwest National Laboratory
- 16 member countries for Phase 4
- Examines environmental effects of marine renewable energy (MRE) development to advance the industry in a responsible manner
- Activities are documented on *Tethys* (<https://tethys.pnnl.gov/>)



Environmental Effects of MRE: Stressors and Receptors

- **Stressors:** marine renewable energy (MRE) devices and systems that may cause harm
- **Receptors:** marine animals, habitats, ecosystem processes



Priority stressor-receptor interactions:



Collision risk



Mooring line encounter



Underwater noise



Changes in
oceanographic systems



Electromagnetic fields



Displacement / barrier
effects



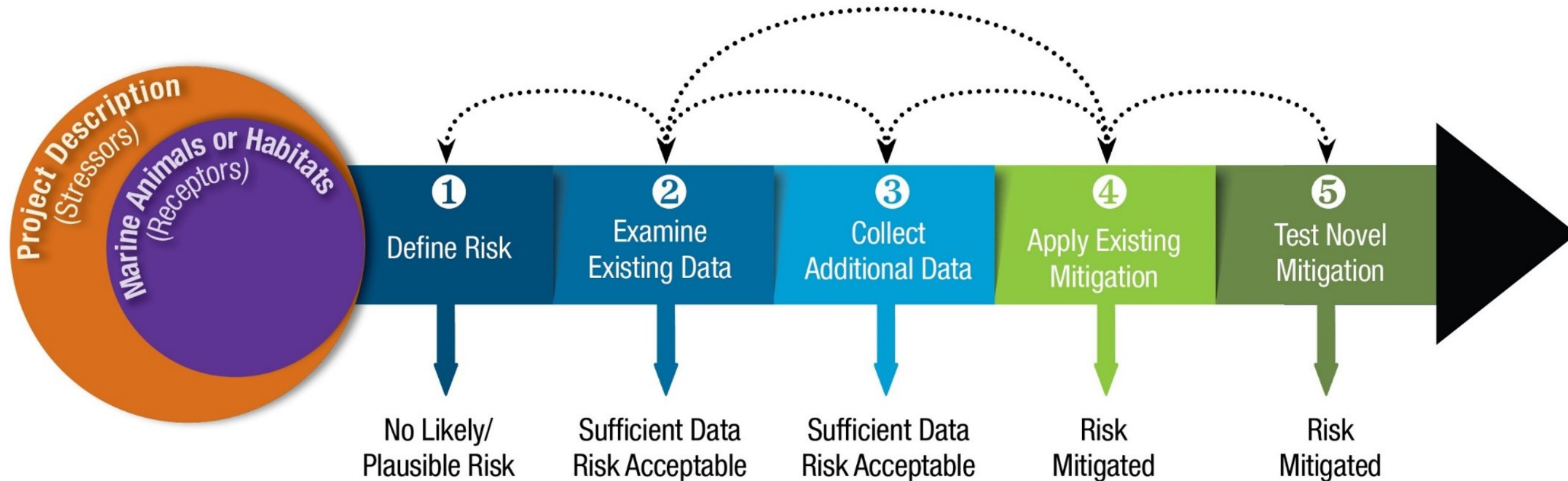
Habitat changes

What is “risk retirement”?

- For certain interactions, potential risks need not be fully investigated for every project for small developments (1-4 devices)
- Rely on what is already known – already permitted projects, research, or analogous industries
- A “retired risk” is not dead and can be revived in the future as more information becomes available for larger arrays
- Risk retirement does not replace or contradict any regulatory processes



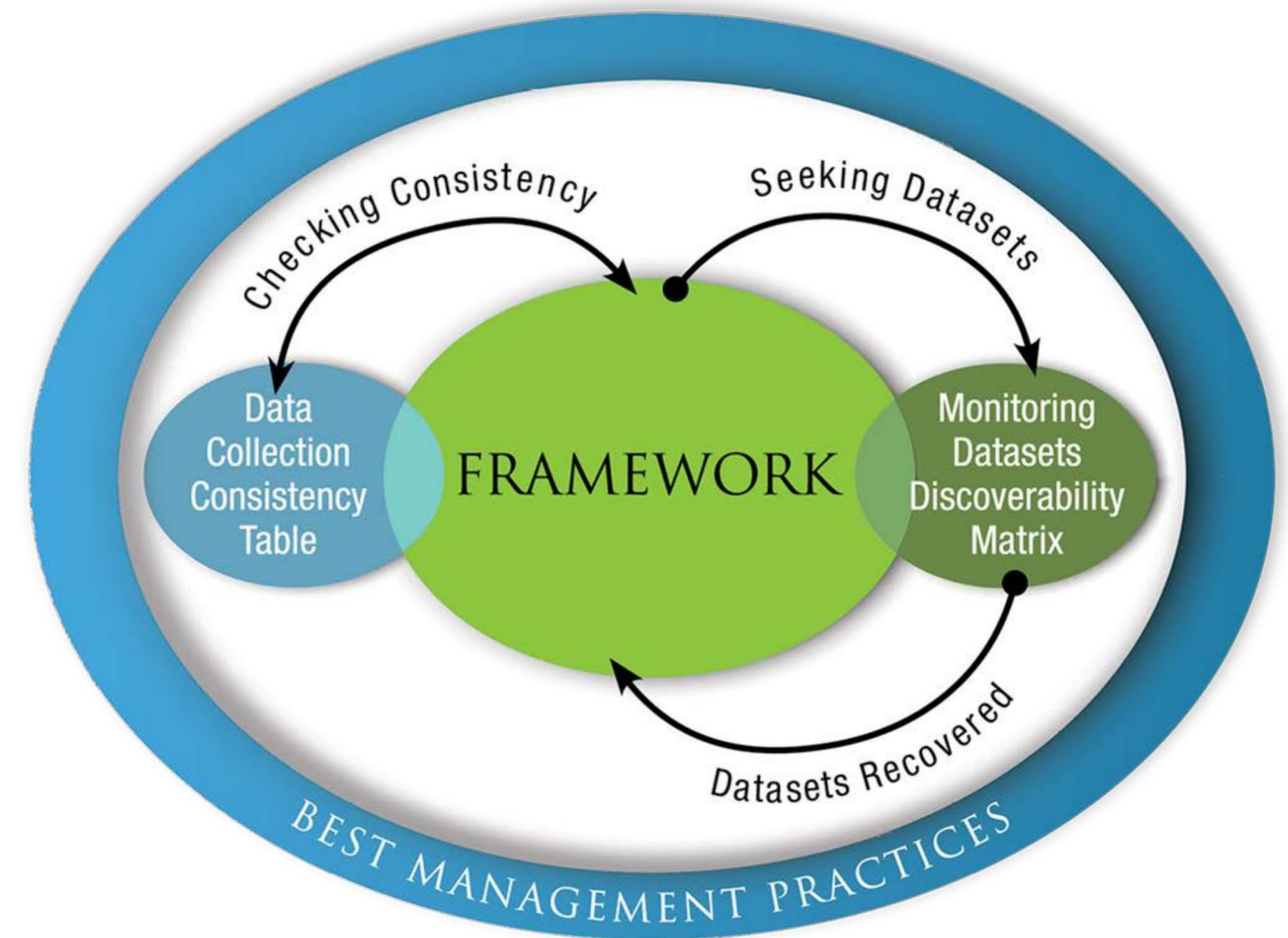
Risk Retirement Pathway



<https://tethys.pnnl.gov/risk-retirement>

Data Transferability

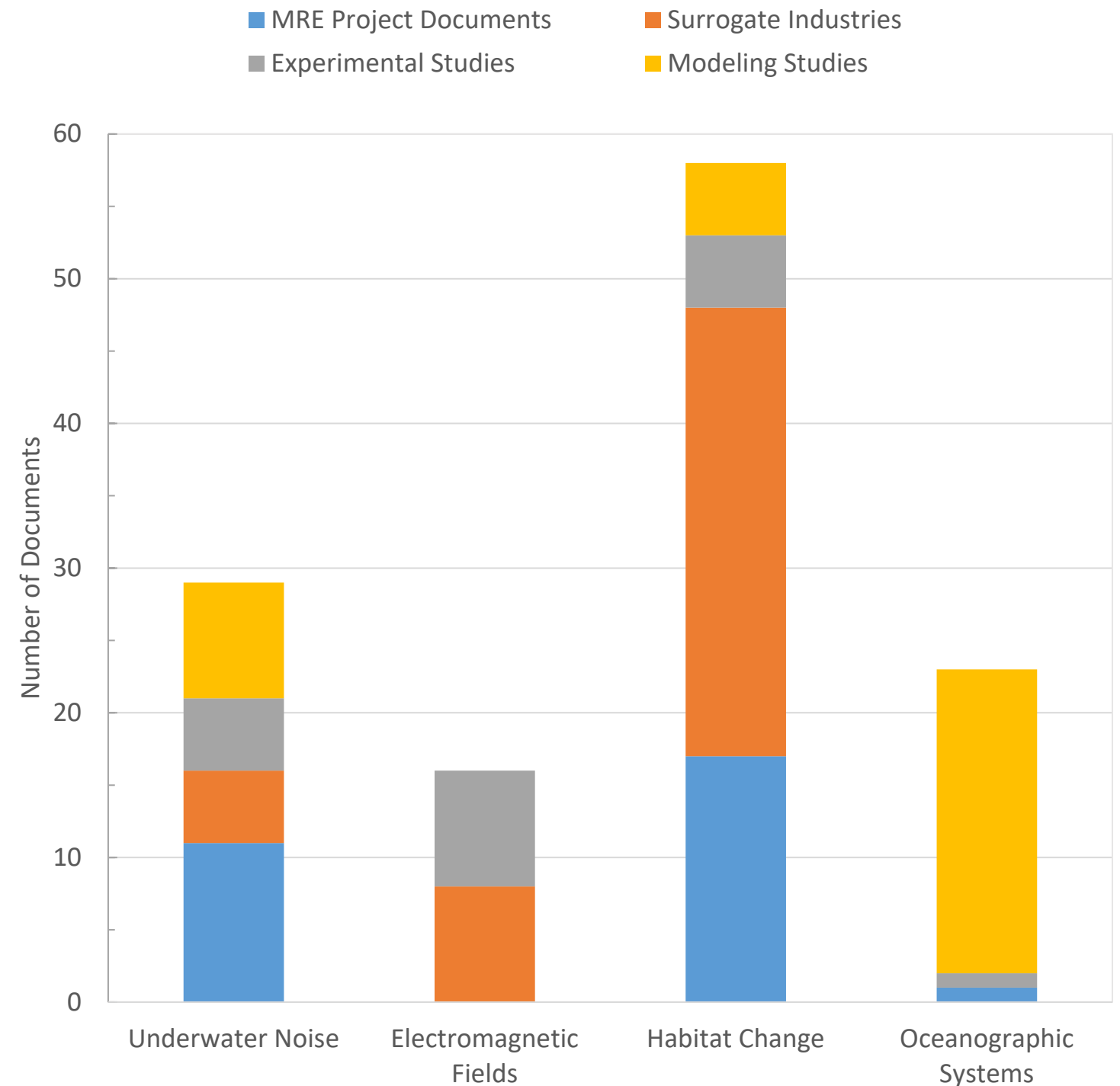
- New MRE projects should be informed by available data/information from
 - MRE projects and research studies
 - Analogous industries
- Site-specific data may be needed for new projects
 - Data/information from established projects may reduce these needs
- Data that might be “transferred” need to be collected consistently for comparison
- Key for risk retirement process



Evidence Bases

- Key research papers, monitoring reports, documents to support risk retirement
- Focused on small number of MRE devices
- Addressed by stressor:
 1. Underwater noise
 2. Electromagnetic fields (EMF)
 3. Habitat changes
 4. Changes in oceanographic systems
- Presented to and reviewed by experts
- Updated annually

Types of documents in each evidence base



Status of Risks

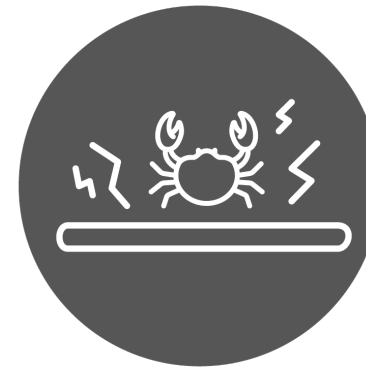
Based on these efforts, the following risks are considered "retired" for small numbers of devices:



Habitat Change



Underwater Noise



EMF



Changes in
Oceanographic Systems

Breakout #1

- In-depth example for habitat change
- Overview presentations on evidence bases and risk retirement for other three interactions
- Discussion and questions



Breakout #1

10:45 – 11:20am



Moving the MRE industry forward

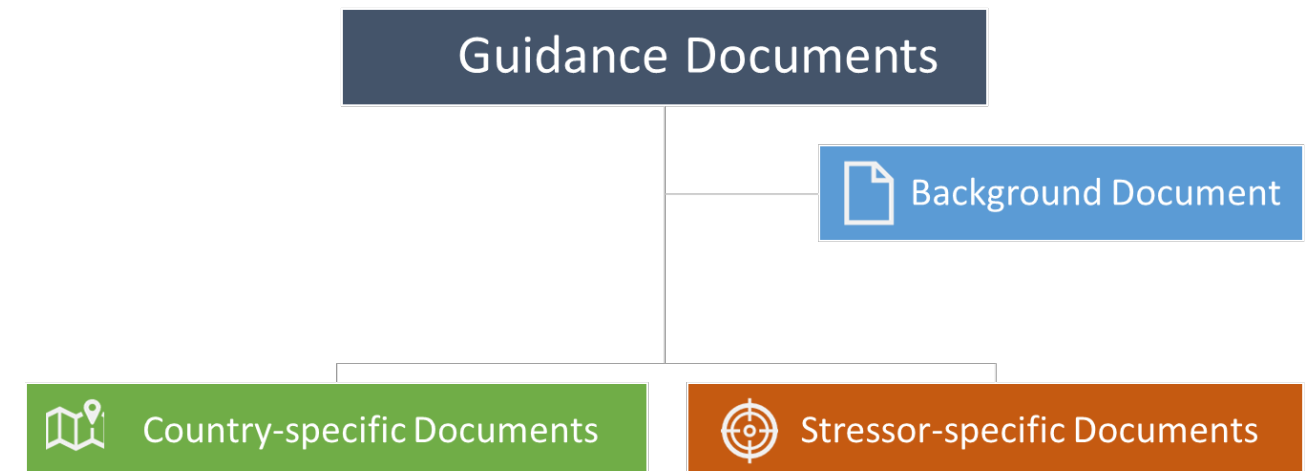
We need more MRE devices in the water to collect data, test hypotheses, and validate numerical models.

- Systematic sharing of information = *Tethys* and PRIMRE
- Organized way to transfer data and information
- Document deliberative process for risk retirement
- Translate science into regulatory guidance



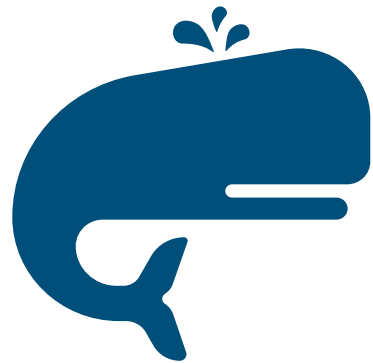
Guidance Documents – Overview

- Guidance documents developed to:
 - Bridge from scientific evidence to regulatory use
 - Provide guidance that fits most nations' regulatory schemes
 - Make information accessible
 - Not to replace any regulation or national guidance
- Organization of the guidance documents:
 - Scheme for categories of regulation
 - Overview flowchart
 - 3 types of guidance documents:
 - ✓ Background
 - ✓ Country-specific
 - ✓ Stressor-specific



Guidance Documents – Categories

4 categories of regulation that fit most countries:



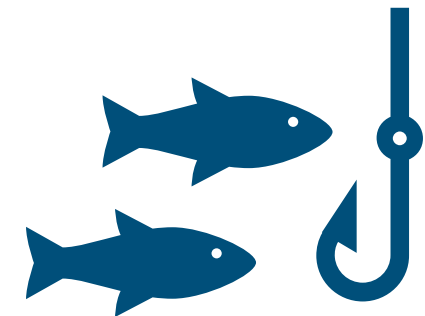
Species and/or
populations at risk



Habitat alteration or
loss



Effects on water
quality



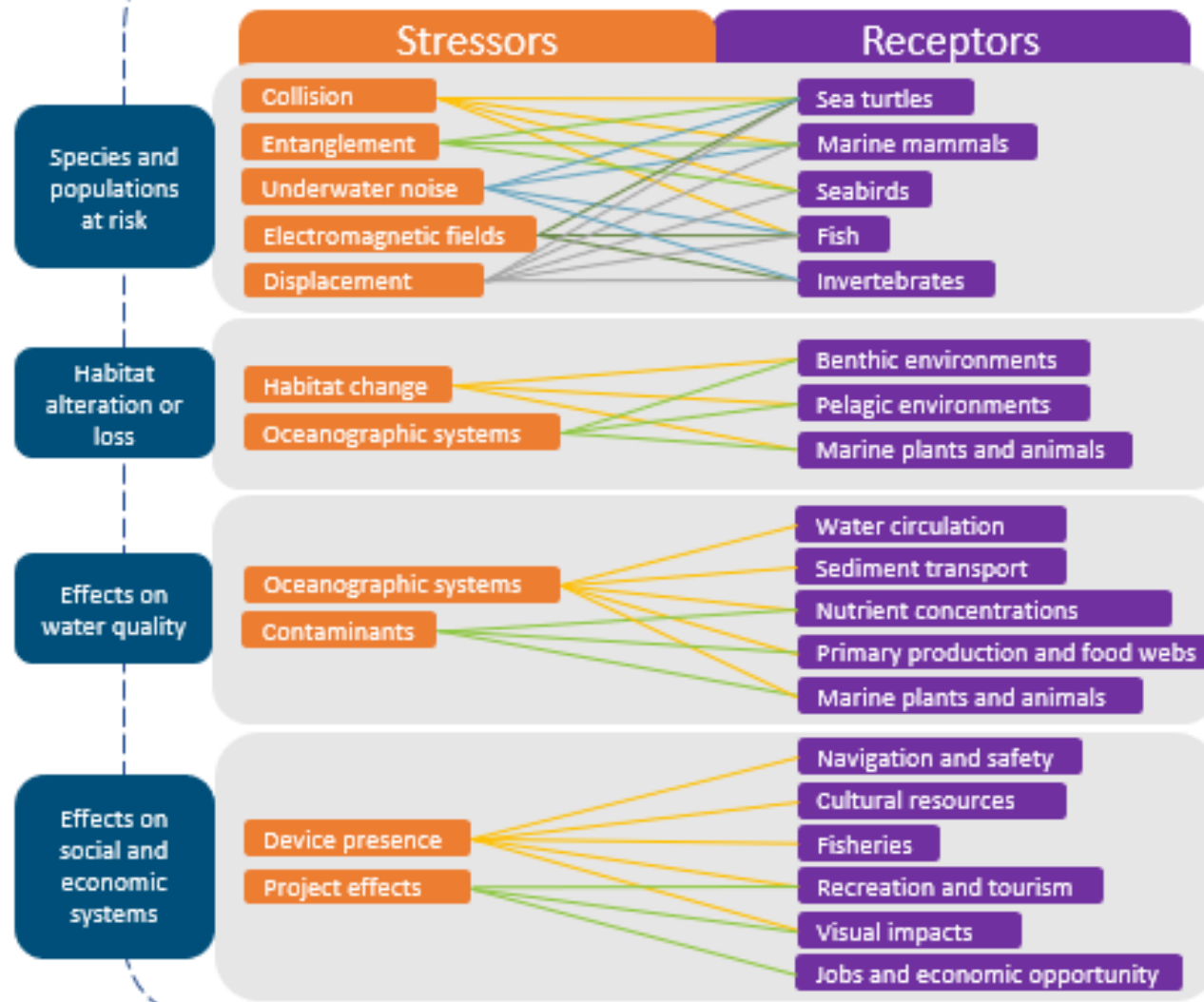
Effects on social
and economic
systems

Process for applying Guidance Documents (1 of 2)

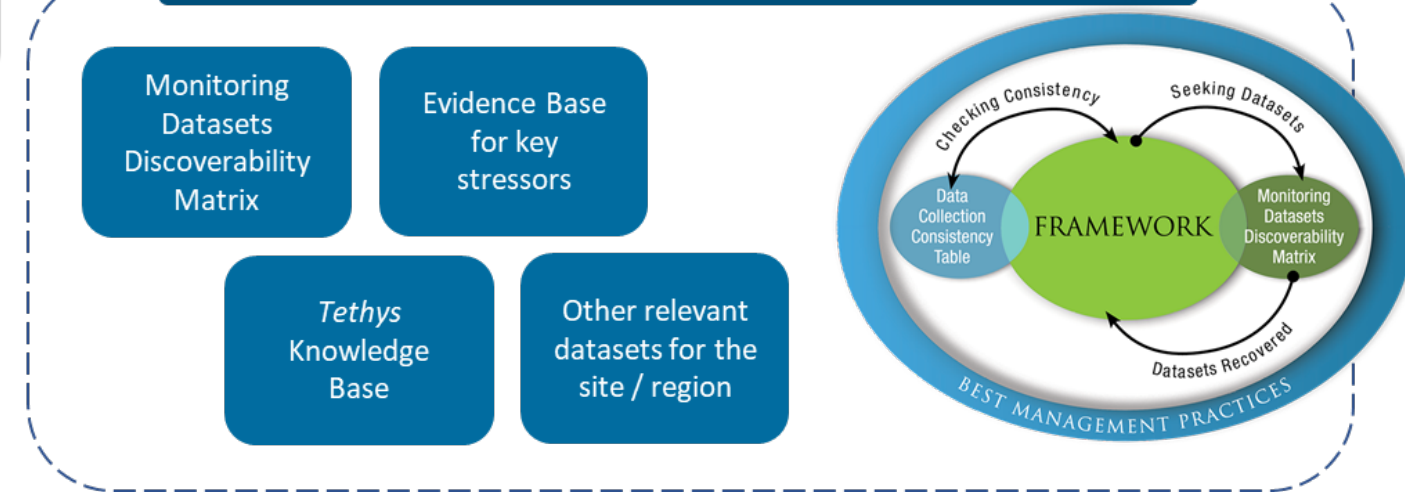
Environmental Consenting for Small Numbers of Marine Renewable Energy (MRE) Devices

1. Project scoping completed by developer, potential for consultation with regulator/advisor

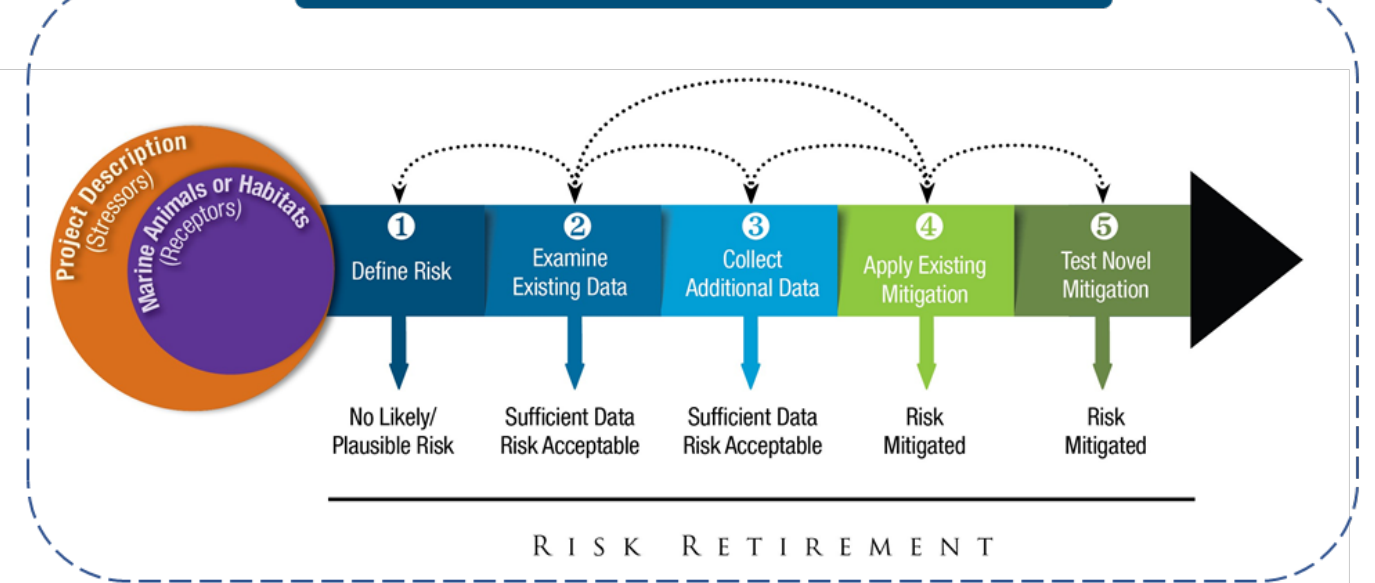
1a. Identify potential environmental concerns at the proposed site



1b. Are data already available that could be transferred?

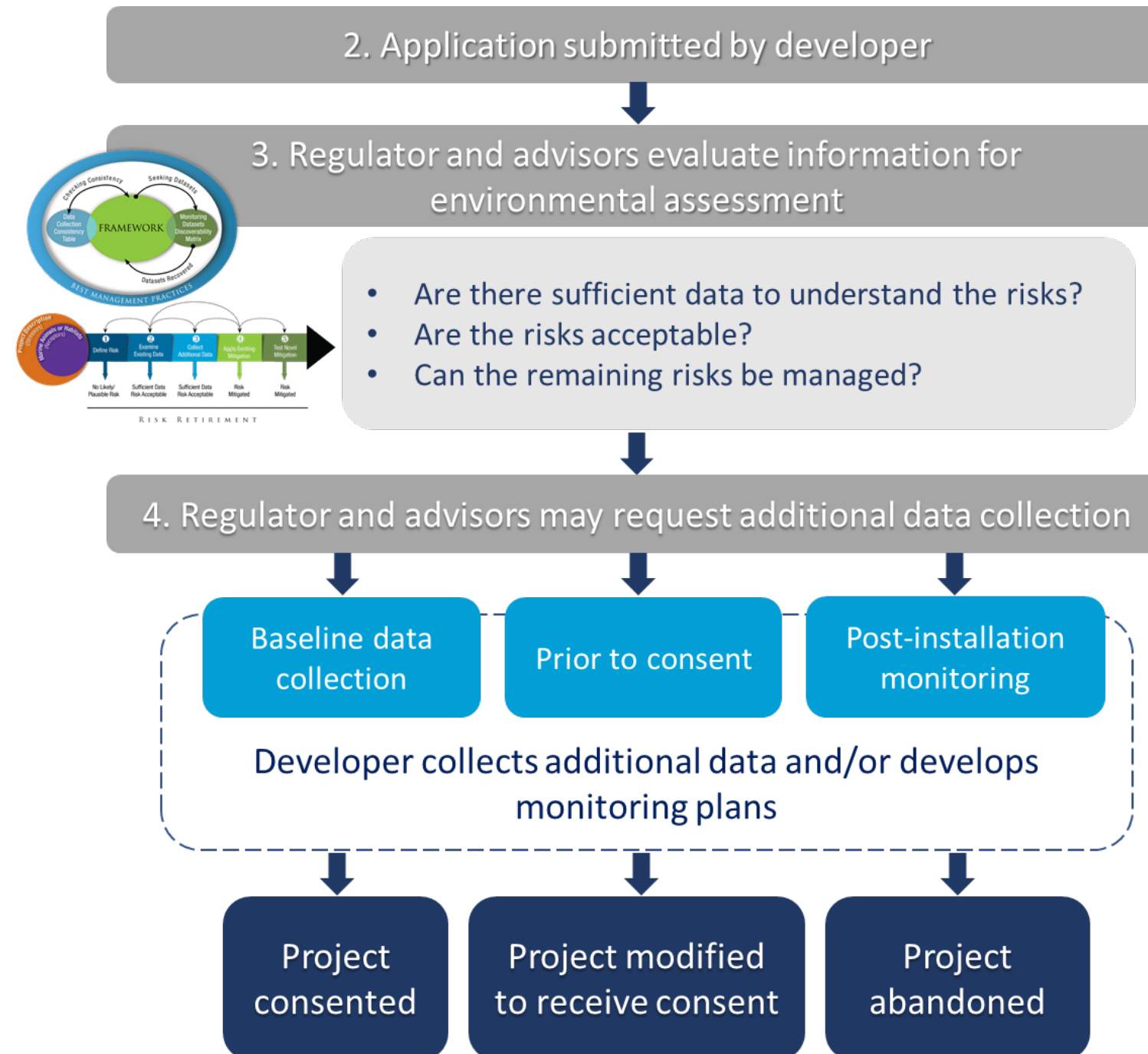


1c. Can any risks be retired or managed?



1d. Have all relevant impact mechanisms, stressors, and receptors been identified?

Process for applying Guidance Documents (2 of 2)



Country-specific documents



- Goal: develop country-specific documents for all OES-E countries
- Includes information on:
 - Regulatory jurisdictions
 - Agencies/regulatory bodies with jurisdiction over MRE projects
 - Key regulations/statutes for environmental effects of MRE by four categories
 - Additional information on marine spatial planning, adaptive management, etc.

Country-specific documents – US example

Table 1. Regulatory jurisdictions in the US.

Designation	Location	Agencies with jurisdiction
State waters	Shore to 3 nm	State agencies, with some exceptions
Federal waters	3 nm to 12 nm	Federal agencies
Exclusive economic zone	12 nm to 200 nm	Federal agencies

Table 2. Federal agencies with jurisdiction over licensing/authorization for marine renewable energy projects.

Agency	Relevant Statute	Implementation
Federal Energy Regulatory Commission (FERC)	Federal Power Act, Energy Policy Act of 2005	Authorization of all marine renewable energy projects in state and federal waters and the exclusive economic zone (EEZ) through FERC license.
Bureau of Ocean Energy Management (BOEM)	Outer Continental Shelf Lands Act, Energy Policy Act of 2005	Responsible agency for seafloor leases, including research leases, between 3 nautical miles and 200 nautical miles.
Relevant federal agencies acting as cooperating agency	National Environmental Policy Act	Environmental assessment performed to identify potential impacts from a proposed action (includes federal agency actions, federally funded activities, or federally permitted/licensed activities) in federal waters and the EEZ and can include state waters.

Country-specific documents – US example

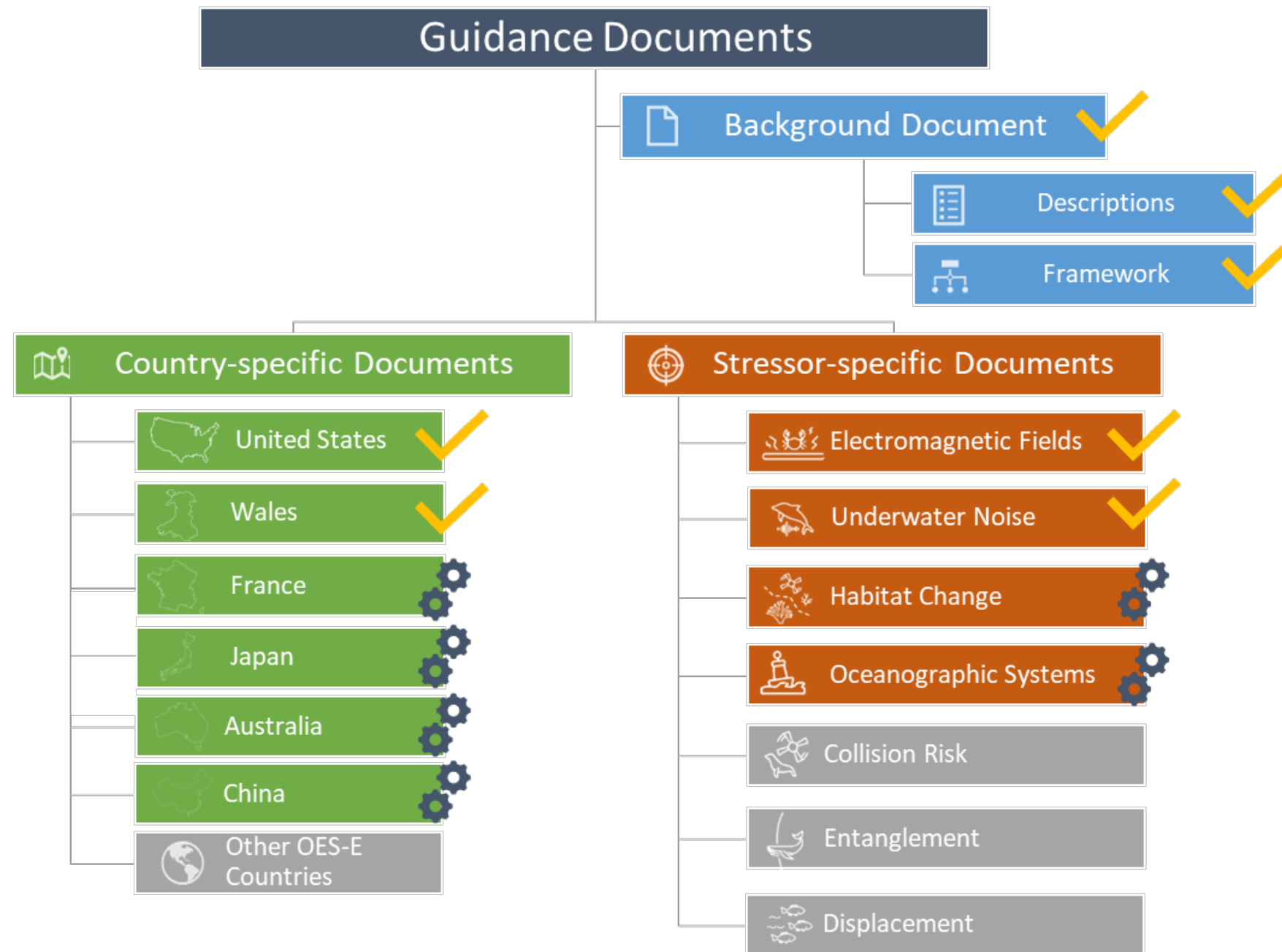
Table 3. Regulations related to species and/or populations at risk.

Agency	Relevant Statute	Implementation
National Marine Fisheries Service (NMFS); U.S. Fish and Wildlife Service (FWS)	Endangered Species Act (ESA) Section 7	Endangered species consultation with NMFS and FWS based on relevant ESA-listed species
NMFS, FWS	Marine Mammal Protection Act	Marine mammal consultation with NMFS and FWS for any marine mammal
FWS	Fish and Wildlife Coordination Act	Fish and Wildlife Coordination Act consultation with FWS
FWS	Migratory Bird Treaty Act	Migratory bird consultation with FWS

Table 4. Regulations related to habitat alteration or loss.

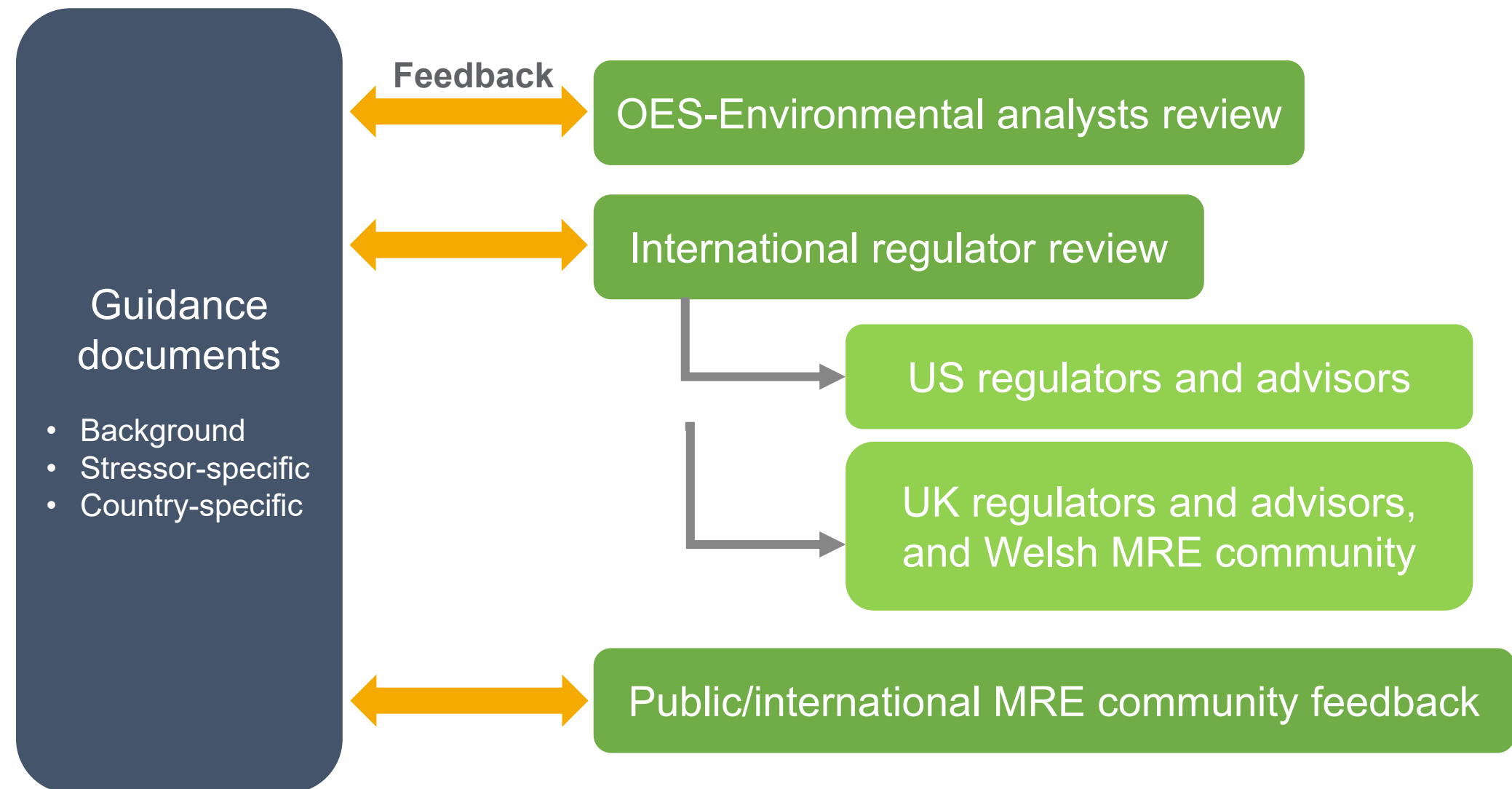
Agency	Relevant Statute	Implementation
National Marine Fisheries Service (NMFS)	Magnuson-Stevens Fishery Conservation and Management Act	Consultation with NMFS if a project is expected to adversely impact Essential Fish Habitat
FWS	Fish and Wildlife Coordination Act	Consultation with FWS for any action that might impact fish and wildlife habitat
NMFS, FWS	Endangered Species Act Section 7	Consultation with NMFS or FWS for any action that might affect designated critical habitat for an ESA-listed marine species

Progress on Guidance Documents to Date



Outreach and Engagement

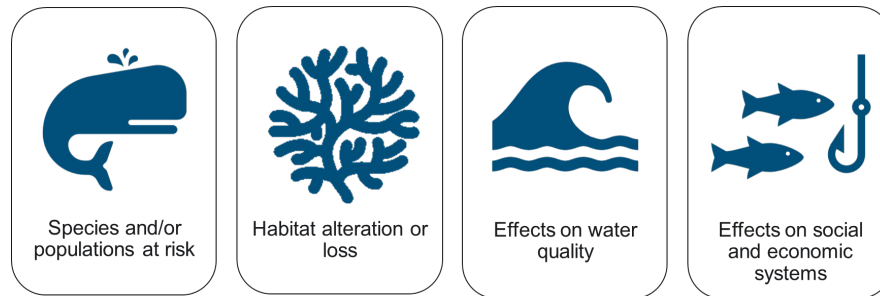
Developing the guidance documents has been an iterative, collaborative, international process



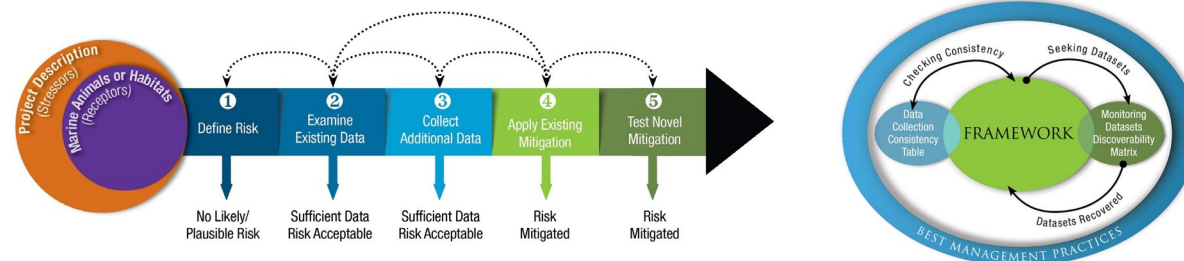
Breakout #2

- Discussion on guidance documents

- Regulatory categories

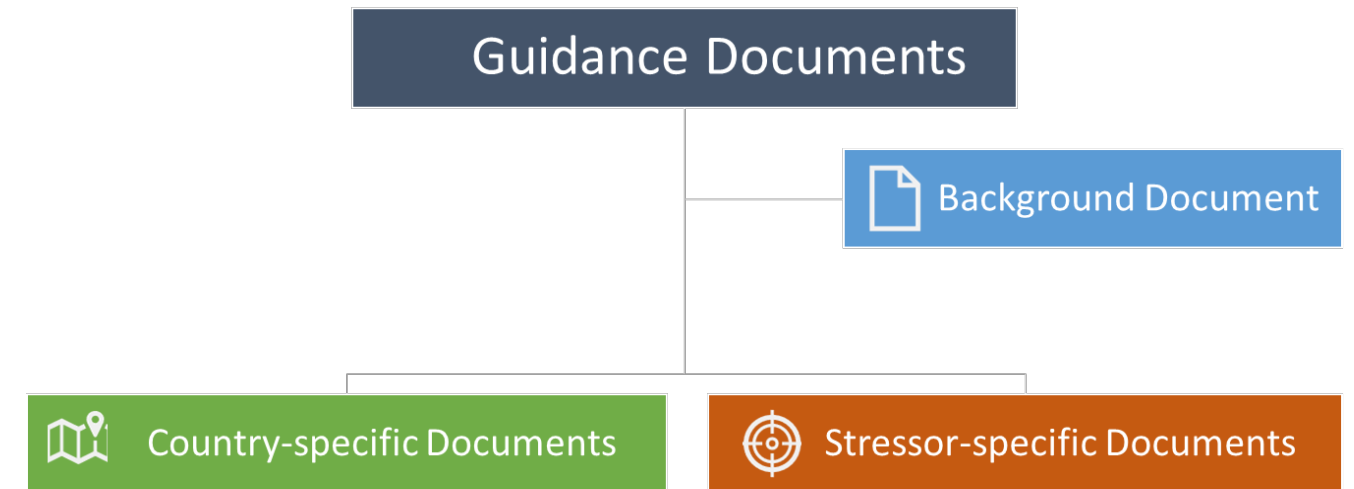


- Framework and applying risk retirement and data transferability



- Exercise on application of guidance documents

- Report out

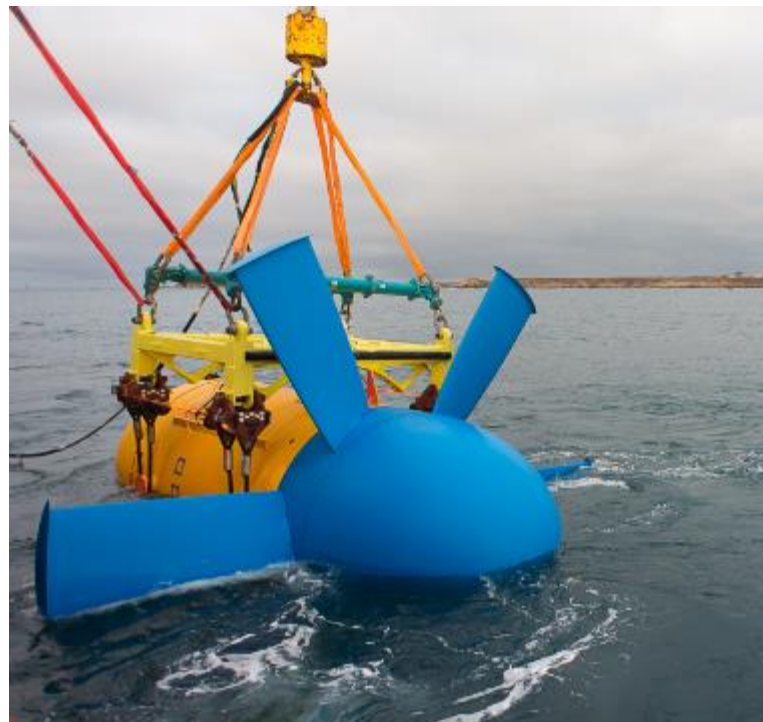


Breakout #2

11:30am – 12:05pm



Report Out



Next Steps

- Develop country-specific documents for all 16 OES-Environmental nations
- Engage regulators, advisors, and developers on useability of guidance documents
- Focus on efforts to increase understanding for collision risk
 - Work with MRE community to set priorities for data collection
 - Improve collision risk/encounter risk models
- Explore new topics:
 - Scaling from single device to arrays
 - Cumulative effects of MRE with other anthropogenic activities
 - Ecosystem effects and ecosystem services of MRE
 - Displacement of marine animals
- Continue efforts to understand differences in environmental effects in tropical/subtropical regions



Feedback Survey



Please fill out our 4-minute survey!

<https://www.surveymonkey.com/r/NZ5RJY9>





Thank you!

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